

## **Chapter 4 Environmental Consultation and Permit Requirements**

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### **4.1 NATIONAL ENVIRONMENTAL POLICY ACT**

The National Environmental Policy Act of 1969, as amended (42 USC 4321 et seq.) requires preparation of an environmental impact statement for major federal actions significantly affecting the quality of the human environment. BPA prepared this environmental assessment to determine if the proposed action would create any significant environmental impacts that would warrant writing an environmental impact statement (EIS). No significant environmental impacts were identified. BPA has also prepared a finding of no significant impact (FONSI). BPA will make a decision about the project soon. If a decision is made to build the facility, BPA would protect, restore, and enhance the environment, where possible.

### **4.2 ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITAT**

Three plant species are federally listed in the state of Washington. They are the Nelson's Checker-mallow (*Sidalcea nelsoniana*) and the Water Howellia (*Howellia aquatilis*), which are threatened; and the Marsh Sandwort (*Arenaria paludicola*), which is endangered. There are no known occurrences of these plants in the project area (WDFW 1999b).

Four species of birds and two species of mammals are federally listed in King County, Washington. They are the bald eagle, peregrine falcon, marbled murrelet, northern spotted owl, grizzly bear and gray wolf. The Washington ground squirrel recently was listed as a candidate species under the Endangered Species Act. None of these species of birds or animals or their habitat is found in the project vicinity (WDFW 1999a and 1999b).

Three species of anadromous and resident fish were recently listed in King County: the chinook and coho salmon and the bull trout. WDFW indicated that none of these species exists above Snoqualmie Falls (Robert Feiffer, Fishery Biologist, WDFW, telephone conversation, November 11, 1999). Other sources support this conclusion that no bull trout or anadromous salmonid species are to be found in the upper Snoqualmie Basin, i.e., above Snoqualmie Falls (Washington River Information System database, 1999; Curt Kraemer, WDFW, telephone and written communication, February 16, 2000).

Based on the proceeding information, therefore, BPA has determined that the proposed action would not affect threatened or endangered species.

### **4.3 FISH AND WILDLIFE CONSERVATION**

Provisions of the Pacific Northwest Electric Power Planning and Conservation Act (16 USC839 et seq.) intended to protect, mitigate, and enhance fish and wildlife (particularly anadromous fish) of the Columbia River and its tributaries, do not apply to the proposed

action or alternatives because the alternatives (including the proposed action) would not adversely affect the Columbia River Basin.

#### **4.4 HERITAGE CONSERVATION**

See Section 3.10.

#### **4.5 STATE, AREAWIDE AND LOCAL PLAN AND PROGRAM CONSISTENCY**

It is BPA's intent to be consistent to the maximum extent practicable with the state, areawide and local environmental standards. BPA cannot be consistent, however, where it must meet other overriding Federal requirements, such as the National Electric Safety Code.

##### ***4.5.1 Memorandum of Agreement (between BPA and WDOE) on State and Local Government Review of BPA Projects in the State of Washington 1990***

The agreement requires that BPA provide full opportunity for state and local entities to review BPA activities for consistency with state and local environmental standards. Local governments may review BPA activities and make recommendations concerning consistency to WDOE. To this end, BPA and WDOE agree to cooperate fully in the review process and seek active and meaningful participation by local governments.

BPA consulted with state and local governments in developing and evaluating alternative routes (see Chapters 2 and 3). BPA prepared this environmental assessment and made it available for public and agency review for 30 days. BPA also held a public meeting during the review period to allow an additional opportunity to receive public input on the proposed project. Comments received at the meeting were used to prepare this Final EA. In addition, although WDOE agreed to complete its recommendation to BPA on consistency of its proposed activities within 30 days of commencement of its review, BPA has not received any comments from the WDOE on the Preliminary EA.

##### ***4.5.2 Washington State Law***

###### **Growth Management Act**

The proposed action complies with the Growth Management Act. The proposed BPA transmission line to serve Tanner Electric has been included in Puget Sound Energy's Long-range Facility Plan, and is included in King County's Utility Element, which is part of the King County Comprehensive Plan.

## Washington Administrative Code

BPA proposes to construct a portion of the line within the I-90 right-of-way. Near North Bend, I-90 is within the purview of the Greenway Trust. As such, the area is considered a scenic area. The following provisions of the Washington Administrative Code are relevant to the proposed project.

**WAC 468-34-280 Overhead Power and Communication Lines.** This section of the WAC recommends that longitudinal installations of power lines (on public rights-of-way) be of single-pole construction, and that joint-use single-pole construction is generally desirable and should be used whenever feasible.

The proposed project's design calls for the 115-kV transmission line to be supported by single wood pole structures within the I-90 right-of-way. The project, as proposed, therefore, is consistent with Section 468-34-280 of the WAC.

**WAC 468-34-290 and 468-34-300 Vertical Clearances and Location.** These sections require that vertical clearances for overhead power lines conform to the National Electric Safety Code and/or the clearances identified in the WAC, whichever are greater. The minimum clearances specified for 115-kV transmission lines are 10 m (32 ft) above the groundline, including roadways. The code also specifies that utility lines be located as near as practicable to the right-of-way edge while still maintaining a reasonably uniform alignment.

The project, as proposed, would conform to the minimum clearances, as required by the National Electric Safety Code, and is located close to the right-of-way edge except where the right-of-way boundary is irregular in shape. At that location, the line maintains a uniform alignment.

**WAC 468-34-330 Scenic Enhancements.** As described in Section 3.8, the Washington Department of Transportation has designated the I-90 corridor in the vicinity of the proposed project as BX. The BX classification covers the I-90 corridor from Mile Post 17 to Mile Post 34. BPA proposes to place a portion of the line in Mile 26 within the BX classification.

According to this section of the WAC:

*(1)...Aerial facilities may be allowed (in this zone) if found acceptable to the department based on design and/or location which will not detract from scenic values typical of those found in Classes A and B.*

*(2) Special exceptions may be made where one or more of the following conditions exist:*

*Power lines of voltage in excess of 35-kV, special design should be incorporated to minimize the visual impact of the facility.*

*Other utility locations are not available or are unusually difficult and unreasonably costly or are more undesirable from the standpoint of visual quality.*

*The placing of the utility underground is not technically feasible or is unreasonably costly.*

*The impact of the required undergrounding adversely affects the utility consumer rates or the long-term economics of the utility.*

At 115-kV, the line BPA is proposing to construct is in excess of 35-kV. To support the transmission line, BPA would use a single wood-pole structure design. The conductors would be non-reflective to reduce light and glare from the transmission line in sunlit conditions. BPA considered eight other route segments in addition to undergrounding the line. These alternatives are considered too costly or less desirable for a variety of reasons (see Section 2.3, Alternatives Considered But Eliminated). BPA therefore conforms to the requirements of WAC 468-34-330, or meets the special exceptions.

#### ***4.5.3 King County Plans and Ordinances***

##### **King County Comprehensive Plan (Chapter 12 of the Energy and Telecommunications Section)**

Section B "Utility Corridor Designation" of Chapter 12 recognizes that "Regardless of conservation efforts, the County's electrical transmission facilities need to be improved to meet existing demand and forecast growth." The purpose of the proposed project is to meet Tanner's current needs as well as to provide for the needs of future customers.

King County has adopted two policies under Section B:

- (1) ET-202 King County and the utilities should identify and preserve corridors to accommodate future electric power transmission and distribution lines. Corridor designation should include: identification of appropriate shared uses and recognition of the values provided by non-utility uses, such as recreation; recognition of County roads as utility corridors; and, evaluation of proposed facility plans on a system-wide basis, rather than project by project.*
- (2) ET-203 When new, expanded or upgraded transmission is required, use of existing corridors that have above-ground utilities should be evaluated first. King County should facilitate appropriate corridor sharing among different utility types and owners.*

Tanner Electric Cooperative, which serves approximately 2000 King County customers in the North Bend and Ames Lake areas, purchases its power from BPA which is delivered to Tanner on Puget's facilities. Puget's forecast for energy use in King County includes the power needs of Tanner Electric; and Puget's Draft GMA Electrical Facilities Plan (contained in Technical Appendix A to the King County Comprehensive Plan) identifies the proposed project as one of the 650 miles of new and upgraded transmission corridors and eight new substations needed to be added to their system. Therefore, the proposed action is found to be in compliance with King County Policy ET-202.

With respect to King County Policy ET-203, the proposed route would use a portion of an existing right-of-way (to the extent practicable) and will be designed to accommodate

an underbuild by Puget. Therefore, the proposed project is found to conform to King County policies to the extent practicable.

### **The King County Zoning Ordinance**

The proposed route would be located within two zoning districts in unincorporated King County: the UR (Urban Reserve) and the RA-5 (Rural-Residential-5 acre minimum) zones. Utility facilities, including high voltage electrical transmission lines, are permitted uses within these zones (21A.06.1350 and 21A.08.060A & B, of the King County Zoning Code).

### **King County Road Standards-1993**

Section 8.01 "Franchising Policy and Permit Procedures," and Section 8.02 "Standard Utility Locations within the Right-of-Way," are applicable to the proposed action.

Section 8.01 states:

*Utilities to be located within existing road right-of-way shall be constructed in accordance with current franchise and/or permit procedure and in compliance with these standards. In their use of the right-of-way, utilities shall be given consideration in concert with the traffic carrying requirements of the road which are namely, to provide safe, efficient and convenient passage for motor vehicles, pedestrians, and other transportation uses. And aesthetics shall be a consideration.*

BPA, and/or its contractor(s), would seek a franchise agreement (from the King County Road Department) to locate the proposed transmission line within the public right-of-way of North Bend Way and would comply, to the extent practicable, with the substantive standards of the county.

Section 8.02 "Standard Utility Locations within the Right-of-way," states:

*[U]tilities within the right-of-way on new roads or on roads where existing topography or storm drains are not in conflict, shall be located as shown in typical sections..., and as indicated below:*

*G. Electric Utilities, power, telephone, cable TV: Undergrounding is preferable, ...otherwise every new placement of utility structures shall conform to the following:*

*Utility poles...may be placed within the right-of-way and shall be as far from the traveled way or auxiliary lane as practicable.*

*1(a). On shoulder type roads [such as North Bend Way], poles or obstacles shall be located back of ditches and in accordance with criteria in Drawing 5-001. Drawing 5-001 states that utility poles may be located no closer than ten (10) feet to the edge of the traveled way, and no poles may be placed on the outside edge of a curve with a posted speed limit of 40 mph or over [such as North Bend Way] unless approved through a variance request. . . .*

*1(c). Notwithstanding the other provisions regarding pole locations described in these standards, no pole shall be located so that it poses a*

*hazard to the general public. Utilities shall place and replace poles with primary consideration given to public safety.*

*4. Locations of poles shall be compatible with driveways and other road features (i.e., they shall not interfere with sight distances, road signing, traffic signals, culverts, etc.) To the extent possible, utilities shall share facilities so that the minimum number of poles is needed.*

BPA will meet the substantive requirements of the King County ordinances to the maximum extent practicable.

#### **4.5.4 City of North Bend Plans and Ordinances**

##### **The City of North Bend Comprehensive Plan**

The City of North Bend's Comprehensive plan identifies the need for an additional electrical substation to accommodate the residents' needs over the next twenty years or so. Both Tanner and Puget agree to develop Tanner's proposed substation site to satisfy the combined need of both utilities. When Puget wishes to provide additional capacity within the City of North Bend for their own needs, they would do so as a part of the Tanner facility.

##### **City of North Bend Zoning Ordinance**

BPA would construct the proposed transmission line and energize Tanner's proposed substation in the Employment Park and the Parks/Open Space/Public Facilities zones in the City of North Bend. Defined as major utility facilities, transmission facilities are conditional uses within the zones. Tanner Electric Cooperative is obtaining a conditional use permit to build their substation (Tanner Substation) within the Employment Park Zone; however, BPA, as a federal government agency, is prevented by the Supremacy Clause of the U.S. Constitution from applying for a conditional use permit from the City of North Bend. BPA will, however, to the best of its ability, meet the substantive environmental requirements of the City of North Bend within these zoning districts.

##### **City of North Bend Road Standards**

The City of North Bend has road standards outlined in the North Bend Municipal Code, but they do not address construction of overhead power lines. The City would abide by the same County standards for North Bend Way and Alm Way that the County has adopted, according to the Assistant City Engineer (Melina Mantchev, City of North Bend, Department of Public Works, telephone conversation, December 17, 1999).

##### **City of North Bend Municipal Code Section 14.10.070 Public Agency or Utility Exception**

A public agency or utility may apply for an exception pursuant to this section if the application of this chapter would prevent the agency or utility from providing an essential service. The examiner would conduct an open record hearing, and approve the application for an exception if it were found that:

1) There is no practical alternative to the development proposal with less impact on sensitive areas; and 2) the development proposal minimizes the sensitive area impacts.

BPA is prevented from applying for local development permits by the federal supremacy clause of the U. S. Constitution. Therefore, BPA will not be making application to the City of North Bend for a public agency or utility exception. While prevented from following local government procedural requirements, BPA strives to achieve local government substantive requirements where possible.

Since it is not feasible for linear facilities such as transmission lines to go around sensitive areas, such as streams, BPA proposes to cross Gardiner Creek, a sensitive area within the City of North Bend.

To minimize any impacts, BPA proposes to span the creek and buffer area to the extent practicable, therefore, BPA would comply with the substantive standards of this ordinance.

#### **Section 14.10.230 Streams**

The proposed transmission line would cross Gardiner Creek, a Category 2 stream in the City of North Bend. The ordinance requires Administrative reviews for installing overhead utility lines (such as transmission lines) over Category 2 streams within the City of North Bend. BPA cannot apply to the City of North Bend for an administrative review, but will minimize the impacts to this sensitive area to the maximum extent practicable.

#### **Section 18.10.030 of the City of North Bend Municipal Code (Building and Dimensional Standards)**

The maximum height for structures within the City of North Bend is 35 feet. BPA is proposing to install poles in excess of this height (65-75 ft) to meet the electric clearance requirements of the National Electric Safety Code. As a result, BPA cannot comply with this section of the Municipal Code.

### **4.6 COASTAL ZONE MANAGEMENT ACT CONSISTENCY**

The State of Washington has an approved Coastal Zone Management Program, which is implemented by the Washington State Department of Ecology (DOE). BPA, as an agency of the federal government, is subject to the Coastal Zone Management Act (CZMA), and is subject to the coordination and consistency requirements of the Act for all projects within Washington's Coastal Zone. Because the proposed transmission line project is in King County, and all of King County is within the Coastal Zone, BPA is subject to the requirements of the Act with respect to the proposed action.

The Coastal Zone Management Act (CZMA) requires that "each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved state management

programs." 16 U.S.C. 1456 (c) (1) (A). These policies include the Shoreline Management Act, and state air and water quality requirements.

**Consistency Statement:** Based on the above evaluation, we have determined that the Tanner Electric Transmission Line Project will comply with the substantive environmental standards specified in the state and local planning documents for the State of Washington, King County, and the City of North Bend. The proposed action is, therefore, consistent to the maximum extent possible.

#### **4.7 WETLAND AND FLOODPLAIN PROTECTION**

See Section 3.6.

#### **4.8 FARMLAND PROTECTION POLICY ACT**

The proposed project location is on land zoned for non-farm use. Therefore, no farmland, as defined in the Farmland Protection Policy Act (U.S.C. 4201 *et. seq.*), would be affected by the proposed project.

#### **4.9 PERMITS FOR DISCHARGES INTO WATERS OF THE UNITED STATES**

In November 1990, the Environmental Protection Agency (EPA) adopted final regulation pertaining to storm water discharges into surface water bodies (40 CFR 122-124). The regulations require that National Pollutant Discharge Elimination System (NPDES) permits be obtained for construction activities, including clearing, grading, and excavation, that disturb 2 ha (5 ac) or more. Under Section 402 of the Clean Water Act (CWA), federal facilities are subject to these permitting requirements. BPA as a federal agency, however, has received a general permit under NPDES from EPA. BPA will use best management practices to ensure that no sediments reach surface waters during construction of the proposed project.

#### **4.10 GLOBAL WARMING**

The proposed project would clear approximately 6.4 ha (16 ac) of vegetation. These trees and plants would change from being collectors of carbon to emitters of carbon in the form of carbon dioxide (a greenhouse gas) as they degrade rather than grow. However, because the amount of clearing would be small, and because low-growing vegetation would re-vegetate cleared areas, the proposed project's contribution to global warming would be negligible.



#### **4.11 THE EXECUTIVE ORDER ON ENVIRONMENTAL JUSTICE**

The Executive Order on Environmental Justice (Executive Order 12898) was enacted in February 1994 to ensure that federal agencies do not unfairly inflict environmental harm on the economically disadvantaged and/or minority groups within the United States or any of its territories.

To ensure compliance with the executive order, each agency was required to develop a strategy outlining how it would address the intent of the order. The Department of Energy (DOE), of which BPA is a part, has developed a proposed environmental justice strategy that outlines the Department's approach, in order to identify DOE actions that may have a disproportionately high and adverse environmental effect on minority and low-income populations. The draft strategy focuses on developing a partnership with our stakeholders, i.e., affected communities, government agencies, tribes and the general public in the early stages of planning and implementation of environmental justice procedures.

The 1990 Census identified the ethnicity of North Bend and Snoqualmie to be predominantly Caucasian, i.e., 97.1 percent and 94.5 percent respectively; and the remainder to be primarily of the Asian, African-American and American Indian (USDC 1990). Section 3.9 describes the economic status of the local population.

Because of the low numbers of minority and economically disadvantaged people in the project area, the proposed action would not have an adverse impact on those groups. The proposed action, therefore, would not violate the Executive Order on Environmental Justice. In addition, however, and in the spirit of cooperation with the local community and its representatives, BPA has prepared this environmental assessment, and has issued the environmental document for public and agency review and comment before making a decision on the proposed action.

#### **4.12 FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA)**

It is unlikely that herbicides would be used during project construction; however, herbicides might be used from time to time to maintain the right-of-way. Only EPA-approved herbicides would be used, selectively applied by licensed applicators according to label instructions. For more information on BPA's proposed vegetation management program, see BPA's Transmission System Vegetation Management Program Final Environmental Impact Statement (DOE/EIS-0285, May 2000) for a thorough discussion of compliance with pertinent standards.

#### **4.13 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)**

No hazardous waste products would be used, discarded or produced by the proposed project. Any solid waste generated on site would either be recycled or properly disposed of in an approved landfill. Merchantable timber cleared from the right-of-way would either be sold, given to the landowners or disposed of according to appropriate

agreements. Slash remaining from clearing would either be scattered on the right-of-way to degrade, left as wildlife habitat, or disposed of in an approved landfill.

#### **4.14 REQUIREMENTS NOT APPLICABLE TO THIS PROJECT**

**4.14.1 Permits for Structures in Navigable Waterways.** The project would not involve construction, removal, or rehabilitation of any structures in navigable waters.

**4.14.2 Permits for Right-of-way on Public Lands.** The proposed project would not cross land administered by another federal agency; therefore, no permits for right-of-way on such lands would be required.

**4.14.3 Clean Air Act.** The proposed project is located in the Seattle/Tacoma Ozone Maintenance Area, but the project would not affect it. The proposed project will not result in emissions remaining under BPA's control. No burning would take place as a result of the proposed project. Trees/slash cleared would not be burned. Vehicles used during the construction of the proposed project would be maintained so as to minimize emissions.

**4.14.4 Safe Drinking Water Act.** No drinking water systems are affected by the project (see Section 3.4), and no pollutants are expected to reach drinking water supplies.

**4.14.5 Toxic Substances Control at Federal Facilities.** No toxic substances would be manufactured or used on this project.

**4.14.6 Energy Conservation at Federal Facilities.** Energy conservation practices are not relevant to the proposed project because no federal buildings would be constructed.

## Chapter 5 Persons and Agencies Consulted

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BPA has consulted with the persons and agencies listed below regarding the Tanner Electric Transmission Line Project. BPA is distributing this environmental assessment to all known interested and affected persons and agencies for further comment on the proposed action, alternatives and environmental impacts.

### Landowners

Kenneth Serack	Thomas and Ester Anderson
<u>Douglas Young</u>	Ginny King
<u>Deborah Bellum</u>	Sheila Wright
P.G. White	Alvin and Cheryl Wallace
Valdis Martinsons	Blake Randleman
James S Hoch	Kuan-Ming Chen
Daniel S. Cruz	Winlock and Carey Miller
Owen L. Walsh	Elizabeth and George Littlewood
Lawrence G. Thompson	Donna and Clifford Cervine
<u>Gary and Michelle Gustafson</u>	Doris Waugamon
James O. Stewart	Michelle and Gary Gustafson
Robert and Karen Gordon	Elizabeth and Carey Miller
Sharon O. Molnar	Conner Homes
Paul Boulanger	<u>Northwest Railroad Museum</u>
Bernie Griwatz	<u>Weyerhaeuser Company</u>
Mark Hennig	Snoqualmie Hills Joint Venture
Scott Brown	Snoqualmie Ridge Business Park
Allan Errington	WRECO (Weyerhaeuser Real
Nathan Kositsky	Estate Co.)
Jay Wilson	Loveless and Dillon Inc.
Leslie Peppin	

### Federal Agencies

Office of Federal Register, National Archives and Record Administration

### State Agencies

Washington State Department of Fish and Wildlife  
Washington State Department of Community Trade and Economic Development,  
Office of Archaeology and Historic Preservation  
Washington Department of Transportation  
Washington Department of Natural Resources  
Washington State Department of Revenue

### Local Agencies

City of North Bend, Department of Community Services

City of North Bend, Department of Public Works  
King County Assessor's Office  
City of Snoqualmie  
King County Historic Preservation Program  
King County Department of Developmental and Environmental Services  
King County Road Department, Traffic Engineering Section  
King County Department of Transportation, Utility Inspection Unit  
King County Department of Natural Resources, Water and Land Resources  
Division  
King County Office of Regional Policy and Planning, King County Courthouse  
King County, Permitting Section  
Puget Sound Regional Council, Seattle, Washington

## Chapter 6 Glossary

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**Bonneville Power Administration (BPA)** The federal power marketing agency under the Department of Energy (DOE) responsible for marketing wholesale electric power from 30 federal dams and one federal nuclear plant throughout Washington, Oregon, Idaho and western Montana, and portions of California, Nevada, Utah and Wyoming. BPA also sells and exchanges power with utilities in Canada and California.

**Bulk power** High-voltage power (usually at 115, 230 or 500-kV) that is normally delivered to a substation before being stepped down to lower voltages through transformers, for distribution to serve local loads.

**Capacity** The maximum load that a generator, piece of equipment or substation, transmission line or system can carry under existing service conditions.

**Circuit** A system of conductors through which an electric current is intended to flow.

**Conductor** Any metallic material, usually in the form of wire, cable, or bar, suitable for carrying an electrical current.

**Connected action** Within the meaning of NEPA, a connected action is an action that is enabled by the proposed action, but not one that would be a part of the action proposed by the project sponsor.

**Danger tree** Any tree growing adjacent to and outside of the transmission line right-of-way which is a present or future hazard to the transmission line. A tree is considered a danger tree if it would contact any of the conductors should it fall, bend, or grow within a given swing displacement of the conductors within a specified growth period (usually five years). Trees that are both stable and unstable are included.

**Dead-end tower** A heavy tower designed for use where the transmission line loads the tower primarily in tension (pull) rather than compression (downward push), such as in turning large angles along a line or bringing a line into a substation.

**Distribution** The transport of electricity to ultimate use points, such as homes or businesses, from a source of generation or from one or more substations.

**Double-circuit** To place two separate electrical circuits on the same transmission structures or poles. Each circuit contains three separate conductors or bundles of conductors.

**Electrical line losses** The electric energy lost (dissipated) in transmission and distribution lines. The amount varies with current (amperes) of the line. If the current doubles, the losses increase by a factor of four. Line losses increase with length of line.

**Full requirements customer** Publicly owned utilities that buy all of their power from BPA. Also referred to as "metered requirement customers."

**Human environment** The human environment includes both the natural and social environment.

**Load** The amount electric energy delivered or required at any specified point or points on a system. Load originates primarily at the energy using equipment of consumers, such as heaters, air conditioners, lights and motors. At BPA, load includes delivery to direct service industries (Note: Load is slightly larger than metered energy because of normal transmission and distribution losses in delivery from generator to consumer). Because loads are used to determine resource requirements, forecasts of electricity use are converted to loads.

**National Electrical Safety Code** Written standards for the design, construction, maintenance and operation of electric supply and communication lines, equipment, and supply stations in order to safeguard persons from hazards associated with those activities.

**National Environmental Policy Act (NEPA)** A 1969 federal law that requires evaluation of the environmental impact of federally-funded projects and programs.

**Non-generating utility** A utility that does not own or contract for generation to serve its loads (see loads, above) but buys power from suppliers.

**Palustrine emergent wetland** Non-tidal wetlands dominated by rooted herbaceous (non-woody) vegetation (e.g., sedges, rushes, cattails) which may be temporarily to permanently flooded at the base but which do not tolerate prolonged inundation of the entire plant; e.g. marshes, fens, bogs, and wet meadows.

**Palustrine forested wetland** Non-tidal wetlands dominated by trees; e.g., forested swamps and bottomland forests.

**Palustrine scrub-shrub wetland** Non-tidal wetlands dominated by woody vegetation less than 6 m (20 feet) high; e.g., shrub swamps, shrub carrs, and pocosins.

**Point of delivery** A point where a utility connects with BPA's transmission system and where BPA delivers power. The delivered power is metered and there is a change of ownership.

**Puget Sound Energy** Puget Sound Energy is an investor-owned utility that serves customers in King and Snohomish counties.

**Right-of-way** An easement for a certain purpose over the land of another, such as a strip of land used for a road, electric transmission line ditch or pipeline. BPA usually acquires easements for its transmission lines, roads and other facilities such as guys and anchors.

**Single-circuit** One electrical circuit consisting of three separate conductors or three bundles of conductors.

**Substation** A non-generating electrical power station that serves to transform voltages to higher or lower levels, and that serves as a delivery point to individual customers such as utilities or large industrial plants. The BPA system has more than 400 substations.

**Tanner Electric Cooperative, Inc.** An electric cooperative in King County, Washington.

**Transmission line** A high-voltage power line used to carry electric power efficiently over long distances.

**Tap Point** The point on a transmission line where a power line to a substation is connected.

**Voltage** The driving force that causes a current to flow in an electric circuit. Voltage and volt are often used interchangeably.

**Voltage drop** The difference between the voltages at the transmitting and receiving ends of a feeder, main or service line. With alternating current, the voltage drop is not necessarily equal to the straightforward algebraic difference of the voltages at the two ends.

**Underbuild** The placement of a distribution line on the same poles as those used to carry a transmission line.

**Wheel, Wheeling** The transmission by an entity that does not own or directly use the power it is transmitting. Wholesale wheeling is used to indicate bulk transactions in the wholesale market, whereas retail wheeling allows power producers direct access to retail customers. The term is often used colloquially to mean "transmission."

## Chapter 7 References

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- Anderson, Richard, Curator of Operations, Northwest Railway Museum, e-mail, 2/3/00.
- Beak Consultants Incorporated. 1997. Wetland and Stream Delineation Report, Snoqualmie-Lake Tradition 115-kV Transmission Line Tap to North Bend, King County Washington. Kirkland, WA.
- Bracken, Daniel. 1998. South Oregon Coast Reinforcement Project, Inter-agency Draft, EIS Consultant Reports, Electrical Effects. August 1998.
- Cowger, J.R., Steven C. Bottemiller (MAI), and James M. Cahill. 1996. Transmission Line Impacts on Residential Property Values, A Study of Three Pacific Northwest Metropolitan Areas, in: *Right of Way Magazine*, September/October, 1996.
- Cowger, J.R., Steven C. Bottemiller (MAI), and James M. Cahill. No date. Impacts on Residential Property Values along Transmission Lines, An Update Study of the Three Pacific Northwest Metropolitan Areas (in draft).
- Felt, Chandler, Demographer, King County Office of Regional Policy and Planning, telephone communication, 4/21/00.
- FEMA (Federal Emergency Management Agency). September 1989. FIRM, Flood Insurance Rate Map, King County, Washington and Incorporated Areas.
- Franklin, Jerry and C.T. Dyrness. 1969. *Vegetation in Oregon and Washington*. USDA Forest Service Research Paper PNW-80, U. S. Department of Agriculture, Pacific Northwest Forest and Range Experiment Station Portland, OR.
- Gens, Ralph. Chief Engineer, Bonneville Power Administration. June 6, 1979. "Electric Field Strength Policy for BPA Transmission Lines."
- Golder Associates. 1998. Tanner Tap Project, Engineering Geologic Reconnaissance, North Bend, Washington, Letter Report, March 26, 1998.
- Keith, Nancy, Executive Director, Mountains to Sound Greenway Trust, written communication, 8/13/99.
- King County Department of Natural Resources (DNR). August 1998. King County GIS coverages. Seattle, Washington.
- Melina Mantchev, Assistant City Engineer, City of North Bend, Department of Public Works, telephone communication, 12/17/99.
- NIEHS (National Institute of Environmental Health Sciences). 1999. National Institute of Environmental Health Sciences Report on Health Effect from Exposure to Power-Line Frequency Electric and Magnetic Fields. Prepared in Response to the 1992 Energy Policy Act (PL 102-486, Section 2118). Prepared by the NIEHS EMF-RAPID Program Staff. National Institutes of Health Publication No. 99-4493.
- State of Washington, Office of Financial Management, Forecasting Division. July 1999. 1999 Population Trends.



Tanner Substation Site Location (plan map, E-1), Tanner Electric Cooperative, Inc.

USDA-SCS (U.S. Department of Agriculture - Soil Conservation Service). November 1973. Soil Survey of King County Area, Washington.

USDA-SCS (U.S. Department of Agriculture - Soil Conservation Service). December 1992. Soil Survey of Snoqualmie Pass Area, Parts of King and Pierce Counties, Washington.

USDC (U.S. Department of Commerce). 1990(a). 1990 Census of Population. Economics and Statistics Administration, Bureau of the Census.

USDC (U.S. Department of Commerce). 1990(b). 1990 Summary, Social, Economic and Housing Characteristics, State of Washington. Economics and Statistics Administration, Bureau of the Census.

U.S. DOE (U.S. Department of Energy). 1995. Questions and Answers about Electric and Magnetic Fields Associated with the Use of Electric Power. National Institute of Environmental Health Sciences and U.S. Department of Energy. DOE/EE-0040.

US-EPA (U.S. Environmental Protection Agency). 1996. EPA Sole Source Aquifer Program, Region 10. <http://www.epa.gov/r10earth/maplib/ssarx.gif>.

WDOE (Washington Department of Ecology). January 1999. Water Quality Program: 1998 Section 303(d) List by Water Resource Inventory Area. [http://www.wa.gov/ecology/wq/303d/by\\_wrias.html](http://www.wa.gov/ecology/wq/303d/by_wrias.html).

WDFW (Washington Department of Fish and Wildlife). 1999a. Streamnet Database.

WDFW (Washington Department of Fish and Wildlife). 1999b. Wildlife Heritage Database.

WDNR (Washington Department of Natural Resources). 1999. Washington Natural Heritage Program.

WSDOT (Washington State Department of Transportation). 1997 Annual Traffic Report.

WSDOT (Washington State Department of Transportation). 1998 Annual Traffic Report.

Walker, Johnnie, Senior Engineer, Historic Traffic Counts 1989-1999, Research Unit, King County Department of Transportation, telephone communication, 2/8/00.

Wentworth, Jane, Program Manager, Noxious Weed Control Program, Resource lands and Open Space Section, Water and Land Resources Division, Department of Natural Resources, King County, telephone and written communication, 1/18/00.

Wicks, Tim, Permit/Franchise Engineer, Washington State Department of Transportation, personal communication, 2/12/99.

Yergeau, Steven, Manager, Utilities and Right-of-way Section, Washington State Department of Revenue, telephone communication, 3/11/00.

Zaffanella, L. E. 1993. Survey of Residential Magnetic Field Sources. Vol. 1: Goals, Results and Conclusions. (EPRI TR-102759-V1, Project 3335-02). Electric Power Research Institute.

Zaffanella, L. E. and Kalton. 1998. Survey of Personal Magnetic Field Exposure Phase I: Pilot Study and Design of Phase II. EMF RAPID Program Engineering Project #6.